

NATIONAL ESTIMATES OF ADULT HIV INFECTIONS



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National Centre for
AIDS and STD Control
Ministry of Health
His Majesty's Government of Nepal
March 2004

A few efforts at estimating HIV infections in Nepal have been made in the past. For example, In 1997, with the assistance of international experts, the NCASC staff and five national sentinel surveillance coordinators arrived at an estimate of 15,000 HIV infected people as of early 1997 and a projection of 1,000 AIDS cases and deaths by the year 2000. The estimation was based on the limited data available at that time. For the first time, adult HIV cases for Nepal have been estimated using available data in the four epidemic regions namely, Kathmandu valley, highway districts, Far-Western hill districts and the remaining hill districts. This report has utilized data collected in behavioral surveillance surveys (BSS) and HIV/STI prevalence studies among the various high-risk sub-populations in the country.

In total, about 60,000 adult HIV cases are estimated in Nepal for 2003. Of this, about half the cases are estimated to be in the highway districts. About 26 percent cases are women. Among the high-risk groups, seasonal labor migrants contribute almost 40 percent of the HIV cases followed by 18 percent clients of sex workers and 14 percent injecting drug users. About 15 percent HIV cases are women from rural areas of Nepal.

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FOREWORD

HIV/AIDS is a major health concern in Nepal. More than five percent HIV/AIDS prevalence among high-risk groups including injecting drug users, female sex workers and labor migrants to high-risk locations in India has challenged policy makers and programmers working in the field of HIV/AIDS to prevent the spread of infection to the general population. The National Centre for AIDS and STD Control, Ministry of Health of Nepal, with the technical support of Family Health International (FHI)/Nepal and United States Agency for International Development (USAID), has routinely conducted HIV sero-surveys in the high-risk groups. However, such surveys cannot measure the magnitude of HIV/AIDS in the country. Due to stigma associated with HIV/AIDS, it is hard to reach some target groups and therefore difficult to conduct a census among them.

These limitations led to the use of a scientific estimation procedure to obtain an informed estimate of the number of HIV/AIDS cases using available information in the country. In 2003, the National Centre for AIDS and STD Control, with technical support from FHI and USAID, conducted an estimation of adult HIV/AIDS cases. For the first time, these estimates were derived for four epidemic regions and combined to derive national estimates. These estimates will be used to inform further development of policies and programs on HIV/AIDS in the country.

I am grateful to those who participated individually and institutionally in the estimation work, meetings, and wrote and published this report. These estimates will be updated when new information is available in the country.

Kathmandu, March 26, 2004



Dr. Ram Prashad Shrestha

Director

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ACRONYMS

ADRA	Adventist Development and Relief Agency
AIDS	Acquired Immuno Deficiency Syndrome
ANC	Antenatal Care
BDS	Blue Diamond Society
BSS	Behavioral Surveillance Survey
CREHPA	Center for Research on Environment, Health and Population Activities
FHI	Family Health International
FSWs	Female Sex Workers
HIV	Human Immunodeficiency Virus
HSS	HIV Sentinel Surveillance
IDUs	Injecting Drug Users
MM	Male to Male
MSM	Men Having Sex with Men
MTCT	Mother to Child Transmission
NCASC	National Centre for AIDS and STD Control
PLWHA	People Living with HIV/AIDS
SACTS	STD/AIDS Counseling and Training Services
SC/US	Save the Children/US
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infection
TB	Tuberculosis
UNAIDS	United Nations Joint Program on HIV/AIDS
UNDCP	United Nations Drug Control Program
UoH	University of Heidelberg
VDC	Village Development Committee
VDRL	Veneral Disease Research Laboratory
WHO	World Health Organization

EXECUTIVE SUMMARY

For the first time, adult HIV cases for Nepal have been estimated using available data on the four epidemic regions namely, Kathmandu valley, highway districts, Far-Western hill districts and the remaining hill districts. Kathmandu valley has the highest epidemic scenario as HIV among injecting drug users (IDUs) and female sex workers (FSWs) in the valley are quite high. Similarly, due to the emerging HIV dynamics among labor migrants in the Far-Western hill districts, this region also has critical conditions.

In total, about 60,000 adult HIV cases have been estimated in Nepal for 2003. Of this, about half the cases are estimated in the highway districts. About 26 percent of HIV cases are women. Among the high-risk groups, seasonal labor migrants contribute almost 40 percent of the HIV cases followed by 18 percent clients of sex workers and 14 percent IDUs. About 15 percent of HIV cases are women from rural areas of Nepal.

Relatively better data were available in the recent years for the estimation of HIV cases. However, data gaps have been felt. Particularly, HIV/AIDS sentinel surveillance (HSS) is not regular and its coverage of high-risk groups is to be reviewed and expanded. Particularly, HSS system should address the issue of labor migrants and its methodology should be reviewed and strengthened.

Finally, it is concluded that the database of HIV cases should be strengthened and such estimation exercises should be conducted regularly.

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1. BACKGROUND

Human Immunodeficiency Virus (HIV) - the virus that causes AIDS (Acquired Immuno Deficiency Syndrome) - is a concern to Nepal as it is emerging as a prominent social and health problem. The HIV virus was first detected in the country in the late 1980s. By the mid-1990s, Nepal had entered the 'concentrated epidemic' stage with HIV prevalence consistently over five percent in some sub-populations such as injecting drug users (IDUs) and female sex workers (FSWs). By the early 2000s, HIV prevalence in these groups had become quite high. For example, HIV prevalence was 68 percent among IDUs in Kathmandu valley in 2001 (FHI, New ERA and SACTS, 2002), 35 percent in Eastern *terai* districts and 22 percent in the Pokhara valley in 2003 (FHI, New ERA and SACTS, 2003). Similarly, 15.7 percent of FSWs in Kathmandu valley were HIV positive in 2001 (FHI, New ERA and SACTS, 2001). In the early 2000s, HIV prevalence in the adult population was estimated to be below 0.5 percent, but AIDS was projected to become a leading cause of mortality by the early 2010s in the adult population of 15-49 years of age (UNAIDS/WHO, 2000).

The components of the Nepalese HIV epidemic

The dominant mode of HIV transmission in the country is still heterosexual relations. FSWs and their clients, and IDUs are identified as the primary subpopulations driving the epidemic. However, the spread of HIV among IDUs can be attributed primarily to unsafe needle sharing (FHI and CREHPA, 2002, 2003). Given widespread international migration of young adults, including cross-border migration and trafficking of girls and women to the Indian sex industry, migrants are emerging as an important component in the HIV epidemic in Nepal (FHI, New ERA and SACTS, 2002a, 2002b; Poudel, 2003; Furber et al, 2002; Pokharel, 2000; Seddon, 1998).

The United Nations Joint Program on AIDS (UNAIDS) and the World Health Organization (WHO) annually estimates the number of HIV infections in Nepal. These estimates provide national prevalence and total number of cases for the country as a whole. However, currently available information indicates extreme geographic diversity in the concentration of at-risk populations and in HIV prevalence in Nepal. This report presents estimates of adult HIV cases in Nepal at sub-national and national levels. In addition, it reviews the available data on HIV/STI prevalence and high-risk behaviors of the most at risk sub-populations. It also highlights the data gaps and discusses improvements in the database required to monitor the HIV epidemic in the country.

2. DATABASE ON HIV IN NEPAL: FOCUS AND COVERAGE

A number of government and non-government institutions and scholars have made efforts to collect information related to the HIV epidemic in various parts of the country. But a systematic and continuous surveillance system is not yet institutionalized in Nepal. This is a serious gap in promoting an effective response. Most of the data generated to date came from program related service statistics and were mainly collected for the purposes of program evaluations and monitoring.

HIV/AIDS sentinel surveillance (HSS) is an important source of data on HIV prevalence in Nepal. The HSS is essential to monitor the course of HIV epidemic in the country. The first HSS in Nepal was initiated in 1991, three years after the identification of the first AIDS case in the country.

The first attempt in the collection of HIV related data in Nepal was the HSS conducted by the WHO. Initially, the HSS was planned to cover five sub-populations - FSWs, Sexually Transmitted Infection (STI) patients, IDUs, antenatal care (ANC) attendees, and tuberculosis (TB) patients. A total of seven sites - Nepalgunj, Mahendranagar, Pokhara, Nuwakot, Kathmandu, Sindhupalchowk and Dharan - were selected and surveillance was planned to be repeated at an interval of six months. However, sites and the interval between the rounds of the HSS, and the sub-groups of population included were changed after a few rounds of the surveillance. Since 1995, the HSS has been limited to STI patients. However, the HSS has not been conducted for the past two years and the National Centre for AIDS and STD Control (NCASC) is reviewing its entire surveillance strategy to adopt the Second Generation Surveillance.

In the absence of continuous surveillance of at-risk populations, ad-hoc sero-prevalence studies are planned on a need-based approach. These surveys are often tailored with behavioral surveillance surveys (BSS) conducted in existing or prospective intervention areas.

In 1995, Family Health International (FHI) conducted a BSS study among sex workers and clients in the nine highway districts of the *terai*. Since 1998, BSS studies are being conducted every year in the 16 *terai* highway districts of Nepal. These studies have been a good source of behavioral data of sex workers and clients in the *terai*. FHI has also conducted two rounds of behavioral and sero-surveys of FSWs and truckers in the 16 *terai* highway districts between Jhapa in the East and Rupandehi in the West. BSS and HIV testing among IDUs were conducted in Kathmandu, Pokhara and Eastern *terai* in 2003. Relatively large numbers of drug users were estimated in these places.

Available information indicates that the HIV infection in Nepal is growing to an alarming level among at-risk sub-populations and gradually penetrating the low risk people such as housewives. The most at-risk sub-groups so far covered by surveillance and other studies are sex workers, clients of sex workers, IDUs and labor migrants to Indian cities and their spouses. Men having sex with men (MSM) are identified as an important high-risk population in neighboring countries and their presence is documented in Nepal, but HIV related data among this cohort are not available.

Given the high prevalence of HIV among the FSWs in Kathmandu and returning migrant laborers in Western Nepal, mother to child transmission (MTCT) of HIV infection cannot be neglected. However, no routine studies have been undertaken to identify and address such infection. Similarly, despite identification of HIV positive individuals among blood donors, no cases infected through blood transfusion are documented. In view of universal screening of the collected blood by the Nepal Red Cross Society, such infections are assumed to be minimal.

2.1 FEMALE SEX WORKERS

Women who exchange sex for cash or goods are defined as female sex workers (FSWs). In Nepal, mainly two types of FSWs - street based sex workers and establishment based sex workers - are known. Those who solicit clients from the street are defined as street based sex workers and those who work in and solicit clients from establishments such as hotels, cabin restaurants, dance restaurants and massage parlors are defined as establishment based sex workers. As the existing legal provisions do not allow engaging in commercial sex work, registered brothels are not identified in Nepal.

Size estimation: Scientific estimates of the number of FSWs are not available for many geographical locations in Nepal where FSWs are seen to be active. For instance, district headquarters and other small towns/market places in the hill districts of Nepal have no scientific size estimation of FSWs. Currently quoted estimates of the number of FSWs in various places range widely. In the Kathmandu valley alone, estimates of FSWs range from as low as 2650 (ILO-IPEC study cited in Kathmandu Post Daily of April 12, 2002) and 7,500-10,000 to as high as 25,000 (Seddon, 1998).

Recently, with the technical support of FHI/Nepal, CREHPA and New ERA have made scientific estimates of FSWs and IDUs in many places of the country. Using social mapping tools, CREHPA and New ERA arrived at an estimate of 4,000-5,000 FSWs in the Kathmandu valley. Similarly, in

Pokhara, about 280-320 FSWs were estimated in a mapping exercise carried out in the valley (FHI and CREHPA, 2002). In the 22 *terai* highway districts from Jhapa in the East to Kanchanpur in the Far-West, CREHPA undertook mapping and extensive consultations for size estimation of FSWs with FHI's implementing partners working in each district. This systematic effort estimated 5,300-6,900 FSWs to be active in the highway and major towns and market centers in the 16 districts from Jhapa to Rupandehi. Similarly, 1,700-2,200 FSWs are estimated to be selling sex in the remaining six *terai* highway districts between Kapilbastu and Kanchanpur. This information was used for estimation of the number of FSWs in the districts along the major highway routes, especially for those not covered by systematic mapping (see Appendix A1).

In the highways surrounding Pokhara, namely the Mugling-Pokhara sector of the Prithivi Highway, Baglung-Pokhara highway and Palpa-Pokhara sector of Siddhartha highway, Save the Children/US has estimated about 800-900 FSWs (SC/US, 2001). Similarly, about 700-800 FSWs are estimated in the highways East of Kathmandu, namely the Kathmandu-Kodari-Jiri sectors of the Kodari highway (ADRA, 2003).

Table 1. Estimated number of FSWs in various locations of Nepal

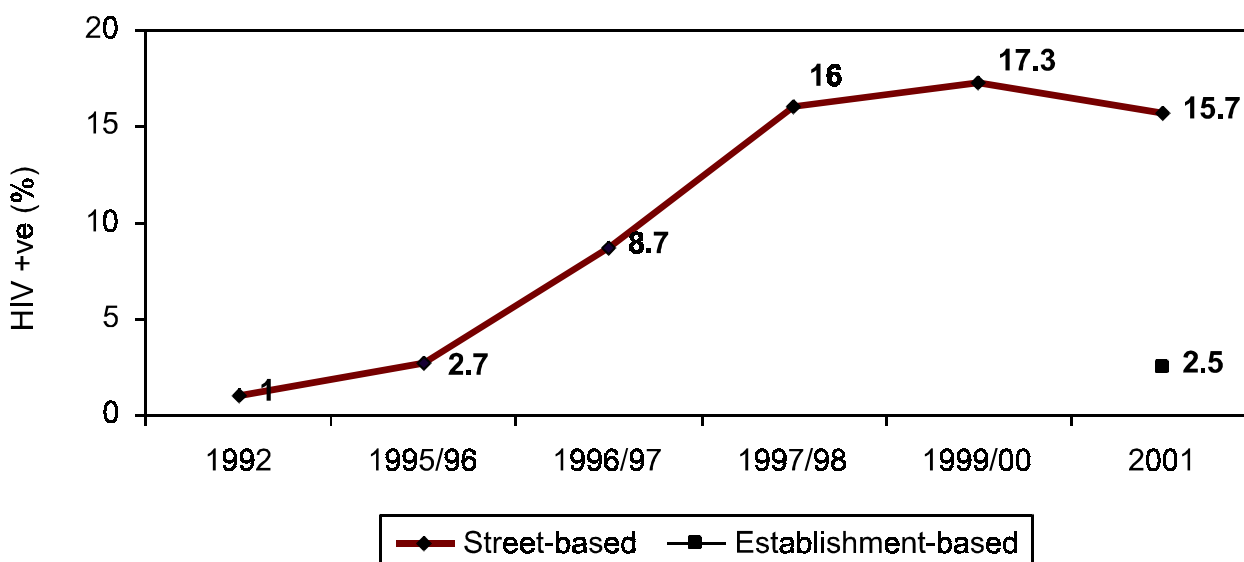
Location	Estimated number of FSWs	Year	Estimated by
Kathmandu valley	4,000-5,000	2001	CREHPA/New ERA
Pokhara sub metropolitan city	280-320	2002	CREHPA
16 Highway and peripheral districts from Jhapa to Rupandehi	5,300-6,900	2003	CREHPA
6 Highway districts from Kapilbastu to Kanchanpur	1,700-2,200	2003	CREHPA
Highway section connecting to Pokhara	800-900	2002	SC-US
Highway areas along Kathmandu-Kodari-Jiri	700-800	2003	ADRA

Note: The figures are rounded off to the nearest 100. These estimates were based on social mapping and key informant interviewing.

HIV prevalence among FSWs in Kathmandu valley has gone up sharply from less than one percent in the early 1990s to nine percent in the mid-1990s and 15.7 percent by the year 2001 (Fig 1). However, the HIV prevalence among FSWs in other towns and highway routes outside Kathmandu is less than four percent. For instance, in the 16 *terai* highway districts between Jhapa and Rupandehi, HIV among FSWs was 3.9 percent in 1999 and it slightly decreased to three percent in 2003 (FHI, New ERA and SACTS, 1999 and 2003).

In the Far-Western city of Nepalgunj, HIV status of FSWs was tested in 1992 and 1993 as one of the sites of HSS (NCASC/WHO, 1992, 1993). In both the samples, HIV prevalence among FSWs was zero. Similarly, in the early 90s, HIV test among FSWs was conducted in Nuwakot, Sindhupalchowk, Pokhara and Dharan. In all these places, the prevalence was less than two percent (NCASC, Surveillance data but reference not known). Except in Pokhara, no HIV test was carried out among the FSWs in those sites between 1993 and until now. A study conducted by the NCASC in Pokhara (NCASC, UoH and CREHPA, 2001) showed that HIV prevalence among FSWs was as low as 0.8 percent. This is an indication that infection among FSWs has not increased in Pokhara as in the Kathmandu valley. Likewise, in the 2003 study, none of the 200 FSWs sampled from the six *terai* highway districts between Kapilbastu and Kanchanpur tested HIV positive (FHI, New ERA and SACTS, 2003).

Fig 1. HIV among street based FSWs in Kathmandu is increasing



2.2 CLIENTS OF FEMALE SEX WORKERS

Clients of FSWs comprise many sub-groups of the male population. Mapping (FHI and CREHPA, 2003) and BSS (FHI and New ERA, 2003) have shown that truckers, rickshaw pullers, industrial laborers, migrant laborers, students, army and police personnel, civil servants, businessmen and students are reported as frequent clients of sex workers. However, most of the behavioral surveys in Nepal have collected behavioral information on truckers, rickshaw pullers, industrial laborers, and police.

Size estimation of clients of FSWs: No direct estimates of the number of clients of FSWs are available. Indirect estimates can be made on the basis of reporting by FSWs about the number of clients visiting them, and the reporting of clients about their frequency of visits to FSWs. A simple formula used for the calculation of clients is shown below. All the information needed for this calculation can be obtained from BSS.

$$\text{Number of clients of FSWs} = \frac{\text{NFSW} \times \text{ADWK} \times \text{ACPD} \times \text{NWPY}}{\text{CRAF}}$$

Where,

- NFSW = Number of female sex workers
- ADWK = Average days worked in a week
- ACPD = Average number of clients per working day
- NWPY = Number of weeks per year
- CRAF = Client repetition adjustment factor (average number of visits of clients in a year)

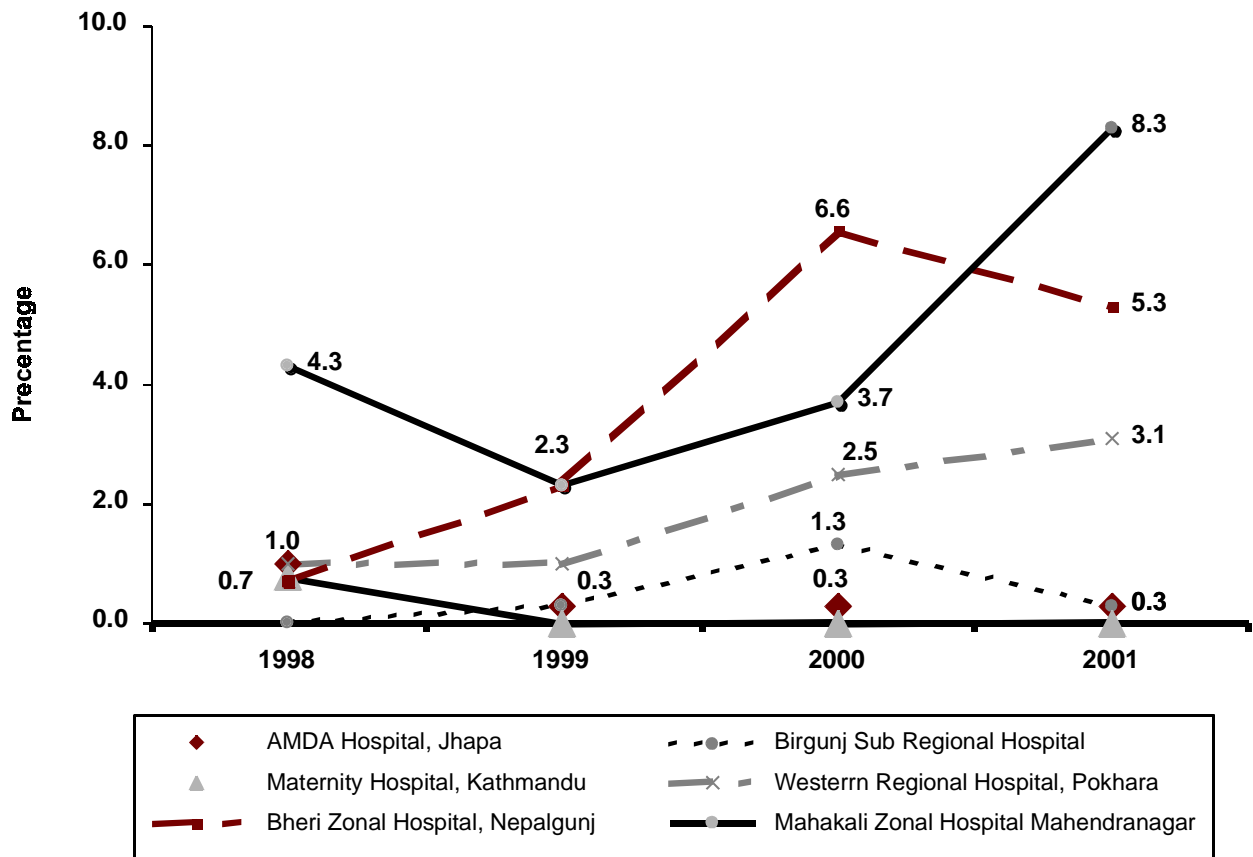
This formula is used to calculate the number of clients in Kathmandu valley and in the highway areas where BSS with FSWs is conducted.

HIV prevalence: Only a few studies provide data on HIV prevalence for specific categories of clients of FSWs. For example, a study in 16 terai highway districts of Nepal documented HIV prevalence of 1.5 percent in a sample of 400 truckers in 1999 (FHI, New ERA and SACTS, 2000). Similar survey replicated in 2003 showed 1.75 percent HIV prevalence among truckers in the same study area.

The HSS conducted since early 1990's provide time-series data on HIV prevalence among STI patients. However, unavailability of information regarding whether male STI clients tested in the HSS had a history of sexual relations with sex workers in the recent past limits the use of these data as proxy information for FSW's clients. Nevertheless, the general impression is that many male STI patients tested in the HSS may be clients of FSWs as there is no evidence to believe that they are infected from elsewhere. Similarly, some others in the STI patient sample may be IDUs and FSWs.

Some clients may visit STI clinics when they develop symptoms of STIs and these men may have a higher chance of having HIV infections compared to other men without symptoms of STIs. However, there are wide variations in the level of HIV prevalence among STI patients tested in different times or places. Usually, higher proportions of STI patients are found to be HIV infected in the sentinel sites of Far Western and Mid-Western regions. In 2001, HIV prevalence among STI patients tested in Nepalgunj and Mahendranagar was 5.3 percent and 8.3 percent respectively, whereas it was nil at the sites in Kathmandu (NCASC, 2001). However, it should be noted that low prevalence of HIV among STI patients in Kathmandu does not match with the high prevalence of HIV among sex workers in Kathmandu. The recruitment procedure of the study participants in HSS is not well documented, so at this stage it is not possible to understand what went wrong in this site. In contrast, HIV infection was as high as 9.9 percent among STI patients attending counseling sessions in Kathmandu in mid-1990s (Gurubacharya and Shrestha, 1997). Since only people with suspicion of HIV might have appeared at the counseling session, these data could be subject to bias and thus limiting generalizability to STI patients. No definite information is available to explain the wide variations in HIV infections among STI patients tested in the past. Because of lack of data on characteristics of STI patients, it is not ascertained whether and how many of them were clients of FSWs. Moreover, the statistics on STI patients are often not segregated by sex. Figure 2 presents the trend in the prevalence of HIV among STI patients by sites.

Fig 2. HIV prevalence among STI patients by HSS sites



2.3 INJECTING DRUG USERS

People who inject various types of drugs in veins or in muscles are defined as injecting drug users (IDUs). Although the practice of taking drugs such as cannabis (marijuana), locally known as *ganja*, has existed in Nepal for centuries, injecting drug use is a recent phenomenon. Heroin (commonly referred to as "brown sugar") was introduced in Nepal in the 1960s, and is mainly smoked or "chased." (UNAIDS and UNDCP, 2000). A significant shift from non-injecting to injecting drug use occurred in the early 1990s with the introduction of buprenorphine - also known as tidegesic (UNAIDS and UNDCP, 2000).

Size estimation: Reasonable estimates of IDUs in all major towns and cities of Nepal are not yet available. Some estimates, particularly in the 1990s, which were largely impressionistic, ranged from 2,500 to 4,000 for the country as a whole, with 2,000 IDUs in the Kathmandu valley (Crofts et al., 1998) and 1,200 in Pokhara (Dixon, 1999). In the late 1990s, very high numbers of IDUs were estimated to be present in several towns. For example, 15,000 to 20,000 IDUs were estimated to

be active in Kathmandu valley alone (Furber et al., 2002). But recent systematic mappings carried out by CREHPA and New ERA in Kathmandu, Pokhara and Eastern *terai* towns in 2001-2002 have estimated 4,000-5,000, 600 and 2,300 IDUs respectively, which are different from the numbers suggested by program NGOs or media reporters. Estimates of the number of IDUs are made indirectly using the information available for the IDUs in the Eastern *terai* cluster (see Appendix A2).

Table 2. Estimated number of injecting drug users

Location	Estimated number of IDUs	Year	Estimated by
Kathmandu valley	4,000-5,000	2001	CREHPA/New ERA
Pokhara	600	2002	CREHPA/New ERA
Jhapa-Morang-Sunsari	2300	2002	CREHPA/New ERA

HIV prevalence among IDUs in Nepal, particularly in Kathmandu, sharply increased after the mid-1990s. In Kathmandu, HIV prevalence was 1.57 percent in 1991 and 2.56 percent in 1992 (Crofts, et al, 1998). This has jumped quickly after the mid-1990s to 50 percent in 1997 and 68 percent in 2002 (FHI, New ERA and SACTS, 2002). A rapid assessment in 1999 among drug users in 11 urban areas of Nepal recorded 40.4 percent HIV positives and 10.7 percent Venereal Disease Research Laboratory (VDRL) test positives among IDUs (Karki, 2000). The IDUs have diffused networks with widespread unclean needle sharing and notable sexual networking within and outside their groups (FHI and CREHPA, 2002). This implies IDUs may play a significant role in diffusing HIV into the general population through their sexual networks. Contribution of the IDUs to the HIV epidemic will depend on their number and sexual as well as needle sharing behaviors.

In the early 1990s HIV prevalence among IDUs in Pokhara was nil (Table 3). For many years after 1993, HIV among IDUs in Pokhara was not measured. Recently, in 2002 FHI commissioned a BSS and HIV survey in Pokhara valley in a sample of 300 male IDUs. The HIV prevalence has increased to 22 percent among male IDUs in Pokhara. This is an indication that, like in Kathmandu, HIV infection in Pokhara is increasing. In the Eastern *terai* districts, the trend in HIV is not known. But the

recent BSS and HIV survey carried out by FHI and New ERA shows that prevalence is as high as 35 percent in this cluster. This study was done in a sample of 345 male IDUs selected from three districts in the Eastern *terai* region (FHI and New ERA, 2003).

Table 3. HIV prevalence among injecting drug users

Location	HIV prevalence	Survey Year	Reference
National (11 towns)	40%	1999	Karki, 2000
Kathmandu	2%	1991	NCASC,
Kathmandu	3%	1992	NCASC
Kathmandu	50%	1999	Karki, 2000
Kathmandu	68%	2002	FHI, New ERA, SACTS, 2002
Pokhara	Nil	1992	NCASC
Pokhara	22%	2003	FHI, New ERA, SACTS, 2003
Eastern <i>terai</i>	35%	2003	FHI, New ERA, SACTS, 2003

2.4 SEASONAL LABOR MIGRANTS AND THEIR SPOUSES

In general, all migrants cannot be considered as a most-at-risk group for HIV/AIDS transmission. However, particular groups of male labor migrants who go to Indian high-risk cities such as Mumbai, and visit sex workers in these places are emerging as a most-at-risk group. Such labor migration is seasonal and migrants frequently return home and are likely to transmit the disease to their spouses through unprotected sex. Therefore, migrants' spouses are also considered as one of the most at risk sub-groups of population.

Employment-oriented seasonal and short-term migration of Nepalese youth and young adult men to cities of Nepal, India and other countries is emerging as a major factor in driving the HIV epidemic in Nepal (Furber et al, 2002; Pokharel, 2000; Seddon, 1998). Young and mobile men who tend to be away from home for periods ranging from a few months to a few years are likely to be involved in casual sex with non-regular partners including sex workers (Puri, 2002; Tamang et al, 2001; WHO, 1999; Suvedi, Gurubacharya and Thapa, 1994).

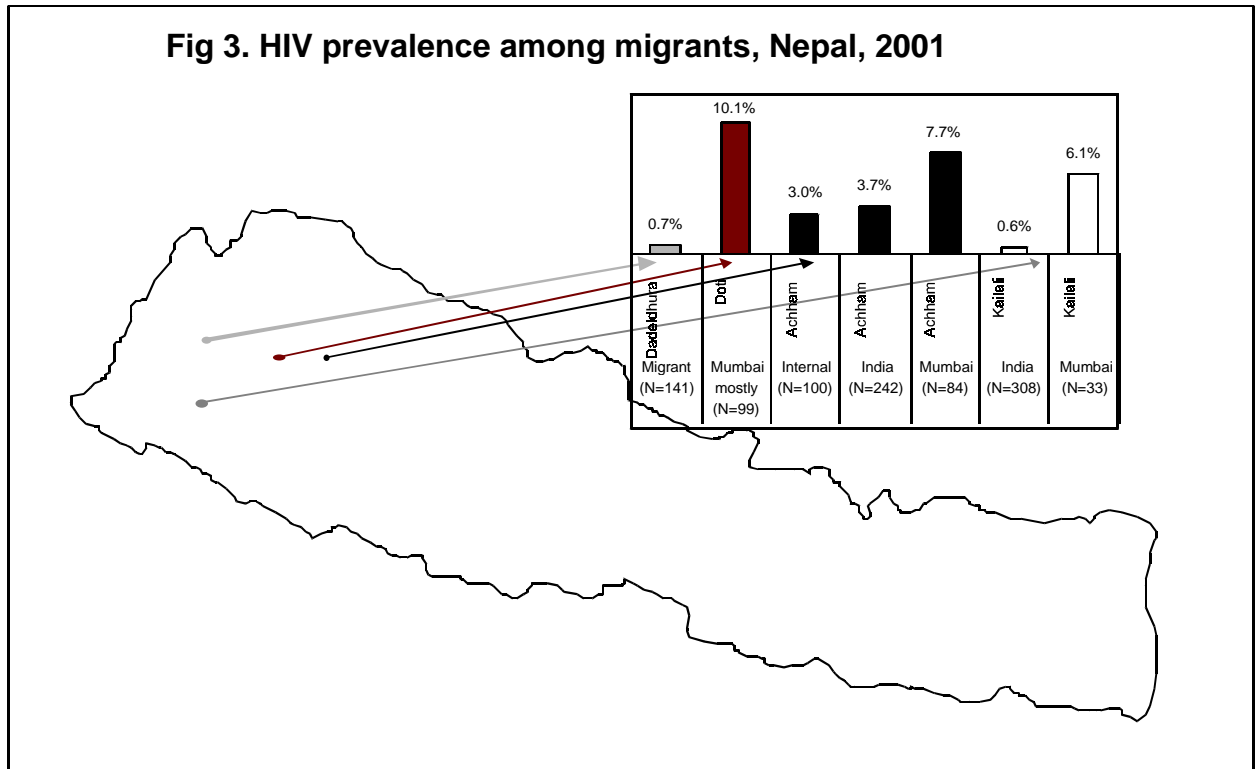
Size estimation: Size of the population absent from their usual place of residence for at least six months duration can be obtained from census data. But census data counts all males and females absent from the household at the time of census irrespective of their age and purpose of absenteeism. However, comparison of absentee population by development regions presented in Table 4 can give some idea about the migratory characteristics of the population.

Table 4. Absentee population by development regions

Region	Absentees to India		Total adult (15-59)		Ratio: absentee to total adult	
	M	F	M	F	M	F
Eastern	60,099	7,239	1,432,509	1,477,128	4.20	0.49
Central	55,881	7,627	2,276,869	21,697,766	2.45	0.04
Western	233,071	30,109	1,094,137	1,300,458	21.30	2.32
Mid-west	80,718	9,288	700,448	729,887	11.52	1.27
Far-west	90,731	14,287	547,967	581,799	16.56	2.46
Total	520,500	68,550	6,051,930	6,259,038	8.60	1.10

Source: Census 2001

HIV prevalence: The existing surveillance system in Nepal does not include migrants. However, a few studies conducted recently in the Far-Western communities have revealed significant prevalence of HIV among migrants to Indian cities, particularly Mumbai, compared to non-migrants or migrants to other places of India (Fig 3). The Doti study (Poudel et al., 2003) has shown an alarming rate of HIV infection (10%) among migrants. However, it should be noted that the participants of this study were Mumbai returnees. In Achham and Kailali also, the prevalence of HIV among Mumbai returnees is high (between 6-8 percent) compared to their counterparts who do not migrate or only migrate within Nepal and other places in India.



Place of origin (district/village), destinations and characteristics of the migrants and differentials in risk of contracting HIV among migrants is not known adequately. However, a rapid qualitative study conducted by FHI Nepal and India among the Nepali migrants in Mumbai shows that the 120 Nepali migrant workers who participated in the study had migrated from both the hills and plains of Nepal. Predominantly, they came from two regions in Nepal. One region was represented by Achham, Doti, Kailali, Surkhet, and Kaski districts, and the districts in the other region included Nawalparasi, Palpa, and Syangja. Nepali migrants had also migrated from various other districts in small numbers. There were more men from two Village Development Committees (VDCs) in particular - Jupu (of Achham), and Latikoili (of Surkhet).

A study in 11 districts of Mid and Far West of Nepal in the beginning of the 1990s estimated that 15 percent of the population migrating seasonally and 49 percent of male and 40 percent of female migrants were reported to have pre-marital or extra-marital sexual relations during the seasonal migration (Suvedi, Gurubacharya and Thapa, 1994).

The mobility factor has yet to be effectively incorporated as a significant component in the research and planning for HIV prevention in Nepal. Thus, it is not surprising to note lack of data on turnover, sexual behavior and STI/HIV prevalence among migrants, especially cross-border seasonal/short-term migrants.

2.5 MEN HAVING SEX WITH MEN

Very little is known about male-to-male (MM) sexuality in Nepal, although there is adequate evidence of this practice in other neighboring countries (Asthana and Oostvogels, 2001; Khan and Hyder, 1998; Khan, 1998), which indicates that Nepal cannot be an exception to this practice.

Size estimation: No systematic efforts have been made to date to estimate the size of the population in Nepal of men having sex with men (MSM). This subpopulation includes men who sell or buy sex, and those who only have sex with men or those who are bisexual. Because homosexuality is stigmatized, MM sexual behaviors and those identifying themselves as MSM are largely hidden in Nepal. Moreover, there are diverse opinions regarding the criteria for defining MSM subpopulations and estimating their numbers. In recent years, especially after the establishment of the Blue Diamond Society (BDS) as an institution for protection of male sexual health in 2001, some MSM are being identified in public forums. The BDS claim that their peer outreach workers have listed thousands of MSM in Kathmandu valley alone. Furthermore, the presence of MSM has also been noticed in other towns outside Kathmandu valley.

In the absence of data on the number of MSM, the size of the MSM population is estimated on the basis of experience from other countries as ranging between one and three percent of the adult male population. Estimates vary from as low as 1-3 percent in Indonesia (where the society is considered conservative and MM sexuality is socially condemned), 2-5 percent in Thailand to as high as 10 percent in European societies where MM sexual activity is socially more accepted.

HIV prevalence: No information is available to determine the HIV infection rates among the MSM subpopulation in Nepal. The levels of HIV infections among MSM around the region vary widely. A recent study found 6.5 percent HIV prevalence among MSM (N=46) in Chennai, India (Vivian et al. 2004). In contrast, HIV infection was assumed to be between 0.4 and 1.34 in Indonesia (MOH Indonesia, 2003). In the absence of data on HIV prevalence among MSM in Nepal, it is assumed that the levels of HIV infection among these men are at the level of national average or slightly higher. The assumed level of HIV infection is 0.5-1 percent.

2.6 GENERAL WOMEN

HIV infection has started to penetrate 'low-risk' women in Nepal. Of the total 3312 HIV cases reported to the NCASC as of December 31, 2003, 314 cases were housewives (NCASC, 2004). These women were infected by their husbands, who were infected from casual sex partners or injecting partners. The HSS among ANC attendees has documented 0.2 percent HIV prevalence among pregnant women in Pokhara in 1993 (NCASC, 1993). The same level of HIV infection (0.2%) was recorded among ANC attendees tested in various towns in 1996 and 1999 (UoH/NCASC, 1999). A marginally higher level of HIV infection (0.3%) was found among 300 family planning attendees in Bir Hospital, Kathmandu in 1999 (UoH/NCASC, 1999). In a study with a sample of 300 pregnant women in Pokhara in 2002, HIV prevalence was found to be 0.2 percent (Poudel, 2003). In contrast, in a study conducted in the Maternity Hospital at Thapathali, Kathmandu in the late 1990s, only one out of a sample of 1000 pregnant women was found to be HIV positive (personal communication with Amod Poudyal, 2004).

3. ESTIMATES OF HIV CASES

A few efforts at estimating HIV infections in Nepal have been made in the past. For example, in 1997, with the assistance of international experts, the NCASC staff and five national sentinel surveillance coordinators arrived at an estimate of 15,000 HIV infected people as of early 1997 and a projection of 1,000 AIDS cases and deaths by the year 2000 (Shrestha, Burathoki and Mugrditchian, 1998). The estimation was based on the limited data available at that time.¹

A regular source of estimates and projection of HIV/AIDS is the UNAIDS/WHO estimates. The UNAIDS and WHO estimated a total of 34,000 people living with HIV/AIDS (PLWHAs) as of the end of 1999 (UNAIDS and WHO, 2000).

The estimates to date have not included international migrants and MSM as separate components but are now increasingly considered as critical contributing factors for the HIV epidemic in Nepal. Based on the available literature on migration and its association with the HIV epidemic, migrants and their spouses are also considered as at-risk-groups. As in neighboring countries with similar socio-cultural settings, MSM is considered as an at-risk group in Nepal also.

3.1 DELINEATION OF HIV EPIDEMIC ZONES

Nepal is administratively divided into five development regions, 14 zones and 75 administrative districts. The country has three ecological zones - mountain, hill and *terai* (low land) - stretched East to West. Distribution of at-risk populations and HIV prevalence is not uniform within a particular administrative or ecological region; it is rather associated with the extension of highways, mobility status and urbanization.

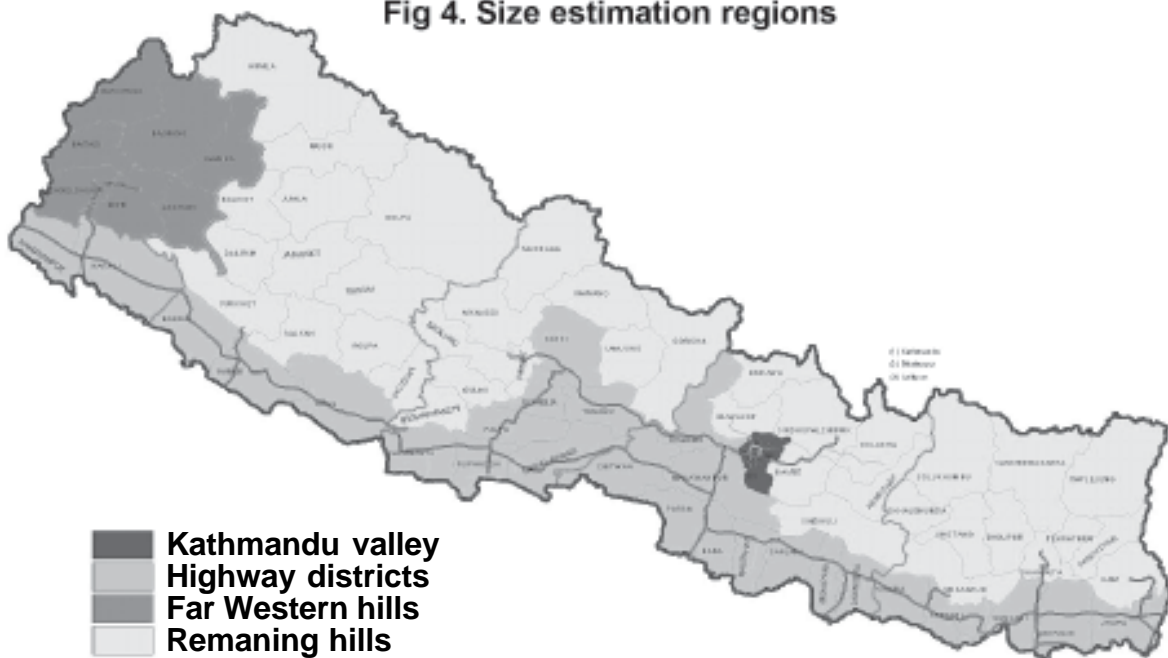
There is large variation in access to roads in the country. The East-West highway is a major route originating in Kakarvitta, the Eastern-most town at the Indo-Nepal border, running through the *terai* region (low land) along the North Indian border and ending at Kanchanpur, the Western-most town. Other major highways with significant traffic include Kathmandu-Narayanghat, Kathmandu-Pokhara, Pokhara-Butwal and Pokhara-Baglung.

Reflecting the available information on the distribution of at-risk populations and HIV prevalence, the country has been divided into four regions for the purpose of the estimation of HIV infections (Table 5 and Fig 4).

¹ Detail on methodology and database is not available. Most probably, the estimation processes was facilitated by James Chin.

Table 5. Size estimation regions and number of districts

Epidemic regions	Number and location of districts
<i>Kathmandu valley</i>	3 districts in the Kathmandu valley
Highway Districts	26 districts along Mahendra, Prithwi and Pokhara-Butwal highway
Far-Western hill	7 hill districts of the Far-Western Development Region
Remaining districts	29 districts (all in hill or mountain regions)

Fig 4. Size estimation regions

3.2 CLASSIFICATION OF SUBPOPULATIONS AT HIGHER RISK AND LOWER RISK

The subpopulations are broadly categorized into i) high-risk groups and ii) low-risk groups. The high-risk groups include IDUs, FSWs, clients of FSWs, MSMs and migrant men. Non-migrant men (excluding clients of FSWs) and general women (excluding active FSWs) belong to low-risk groups. Different categories of population have different levels of risk behaviors and different levels of HIV prevalence. Taking this diversity into account, the following classification has been considered for the estimation.

Populations at higher-risk

- Injecting drug users (IDUs)
- Female sex workers (FSWs) [classified as street-based and establishment-based where information available]
- Clients of FSWs
- Seasonal labor migrants
- Men having sex with men (MSM)

Female partners of high-risk populations

- Partners of IDUs
- Partners of Clients of Sex workers
- Partners of MSM
- Partners of seasonal labor migrants

Low Risk women

- Urban low risk female population
- Rural low risk female population

3.3 REGIONAL AND NATIONAL ESTIMATES OF ADULT HIV INFECTIONS

Estimates of adult HIV infections as of end of the year 2003 are derived for each of the four regions mentioned in the previous section. Average number and proportion of the adult HIV infections (or number of people living with HIV/AIDS: PLWHA) for the subpopulations considered in the estimation model in the four epidemic regions are presented below. The details of the estimates are given in Appendix A3. A range of HIV cases are estimated based on the utilization of minimum and maximum estimates of the size of the population exposed to the risk of HIV and the prevalence of HIV in those groups. Minimum size of the at-risk population and minimum prevalence of HIV produces the lowest estimate of HIV cases. Similarly, maximum size and maximum prevalence produces the highest estimates.

3.3.1 ESTIMATES OF HIV CASES FOR KATHMANDU VALLEY

The average number of estimated HIV cases in Kathmandu is about 8,000, which ranges between 6,000 and 10,000. Main contributors to the HIV cases in the Kathmandu valley are IDUs and clients of FSWs. Of the total average estimated number of HIV cases in Kathmandu, nearly two fifths are IDUs and a third are clients of FSWs (Table 6).

Table 6. Regional estimates of adult HIV cases: Kathmandu valley

Kathmandu valley	Size estimates		HIV prevalence		Average PLWHA	
	Min	Max	Min (%)	Max (%)	N	% of total PLWHA
IDU	4,000	5,000	63.00	73.00	3,060	39
MSM	5,000	15,000	0.50	1.00	75	1
Sex workers – street-based	2,000	2,500	15.60	17.00	367	5
Sex workers- establishment-based	2,000	2,500	2.00	3.00	56	1
Clients of sex workers	75,000	94,000	2.93	3.33	2,648	33
Seasonal labor migrant	25,000	50,000	1.23	2.57	713	9
Urban female low risk pop	305,980	306,580	0.10	0.30	613	8
Rural female low risk pop	203,986	204,386	0.10	0.30	408	5
Total					7,940	100.0

Estimates and assumptions for size and HIV prevalence: Kathmandu valley

Key assumptions made on the calculation of size and the prevalence of HIV for some sub-groups of population in the Kathmandu valley are described below

MSM size :	1-3% of adult male population aged 15-49 assumed
MSM HIV prevalence :	0.5% - 1% assumed
FSW size :	4,000 – 5,000 estimated by FHI/CREHPA/New ERA by mapping
FSW HIV prevalence :	Low = 15.6%, from the 2001 survey of SACTS in Kathmandu High = 17%, from the 1999 survey of SACTS in Kathmandu HIV prevalence for establishment-based FSWs is 2% - 3% based on SACTS's 2001 study in Kathmandu
IDU size :	4000-5000 based on New ERA and CREHPA's mapping exercise
IDU HIV prevalence :	Low = 63% and High = 73%, based on FHI/New ERA's 2001 study in Kathmandu
Clients size :	(No. of FSW x 4.1 clients per week x 52 w)/10 [10 is assumed as the factor to adjust repeated visits]. For establishment-based, client per week is assumed to be 3.1 as indicated by 2002 FHI/CREHPA study
Clients HIV prevalence :	HIV prevalence data for clients in Kathmandu are not available and HSS data of clients in Kathmandu are unreliable. Therefore, HIV prevalence for clients is estimated as being 2 to 3 times less than that of the sex workers. The factor has been derived on the basis of HIV prevalence data for FSWs and clients in the <i>terai</i> highway
Migrant size :	5% - 10% of adult male population
Migrant HIV prevalence :	Estimated as one third of the HIV prevalence for migrants in the Far-Western hills assuming that the majority of the migrants from this region do go to Mumbai

3.3.2 ESTIMATES OF HIV CASES FOR HIGHWAY DISTRICTS

In the 26 highway districts included in this region, about 28,000 individuals are estimated to be HIV infected, which is about half of the national estimates. The estimates ranged between a minimum of 11,000 and a maximum of 52,000 HIV cases; the wide range of estimates is due to possibility of wide variations on estimate of number of at-risk populations and HIV prevalence. The seasonal labor migrants and clients of FSWs, each accounting over a quarter, share major proportions of HIV cases in this area. Rural women and IDUs are two other important subpopulations, each sharing about one-fifth of the total PLWHAs in terms of their contribution to the total number of HIV infections in this region. (Table 7).

Table 7. Regional estimates of adult HIV cases: highway districts

Highway districts	Size estimates		HIV prevalence		Average PLWHA	
	Low	High	Low (%)	High (%)	N	% of total PLWHA
IDU	11,000	21,000	22.00	40.00	4,960	17
MSM	33,000	100,000	0.50	1.00	499	2
Sex workers	10,000	24,000	2.00	4.00	510	2
Clients of sex workers	225,000	540,000	1.20	2.70	7,458	26
Seasonal labor migrant	325,000	500,000	0.60	3.50	8,456	30
Urban female low risk population	494301	496401	0.10	0.30	991	3
Rural female low risk population	2801037	2812937	0.10	0.30	5614	20
TOTAL					28,488	100

Estimates and assumptions for size and HIV prevalence: Highway districts

Some assumptions made on the calculation of size and the prevalence of HIV for some sub-groups of population in the highway districts are described below:

MSM size :	1-3% of adult male population (aged 15-49)
MSM HIV Prevalence :	0.5% - 1% assumed
FSW size :	0.15-0.36% of adult female based on FHI/CREHPA's mapping (see Appendix A1)
FSW HIV prevalence :	Low = 2% and High = 4%, based on 2003 survey of FHI/New ERA/SACTS in 16 <i>terai</i> districts. Most FSW affiliated with some sort of establishment.
IDU size :	0.32-0.63% of adult male. Based on the percentage of estimated number of IDUs of the total adult male population in Jhapa and Sunsari districts respectively.
IDU HIV prevalence :	Low = 22%, HIV prevalence among Pokhara IDUs in 2003 (FHI/New ERA/SACTS survey), High = 40%, from 1999 national estimate based on the NCASC survey (Karki, 2000)
Clients Size :	(no. of FSW x 4.1 clients per week x 52 w)/10 [10 is the average number of visits of clients per year]
Clients HIV prevalence :	Low = 1.2%, prevalence for unmarried truckers in the 16 <i>terai</i> districts, 1999 survey of FHI/New ERA/SACTS High = 2.7% average of STI patients in 6 HSS sites (NCASC, 2001). Most of the STI patients are assumed to have sexual contact with sex workers
Migrant size :	10% - 15% of adult male population
Migrants HIV prevalence :	Low = 0.6%, migrants Kailali High = 3.5%, average of STI patients in 5 HSS sites excluding Kathmandu. It is assumed that the STI patients visiting the HSS sites are predominantly migrants

3.3.3 ESTIMATES OF HIV CASES FOR FAR-WESTERN HILLS

This region includes only seven districts located in the hill areas of the Far-Western Development Region. Seasonal labor migration is the single most important factor associated with the HIV epidemic in this region. The male seasonal labor migrants and their wives account for over two-thirds and a quarter of the HIV cases in this region respectively (Table 8). Estimate ranges between 7000 to 23000 in this region giving an average of 14000 PLWHAs.

Table 8. Regional estimates of adult HIV cases: Far-West hill districts

Far-West hills	Size estimates		HIV prevalence		Average PLWHA	
	Low	High	Low (%)	High (%)	N	% of total PLWHA
IDU	600	1,000	22.00	35.00	228	2
MSM	2,800	8,300	0.50	1.00	42	0
Sex workers	700	1,400	3.00	5.00	42	0
Clients of sex workers	15,000	30,000	1.00	2.50	393	3
Seasonal labor migrant	130,000	210,000	3.70	7.70	9,690	69
Partners of IDU	240	400	11.00	17.50	46	0
Female partners of MSM	420	840	1.50	2.50	13	0
Partners of clients of sex workers	9,000	18,000	0.50	1.25	118	1
Partners of migrants	91,000	147,000	1.85	3.85	3,391	24
Total					13,963	100

Note: Percentages in the last column are rounded so less than 0.5% has been seen as "0".

Estimates and assumptions for size and HIV prevalence: Far-West hills

Some assumptions made on the calculation of size and the prevalence of HIV for some sub-groups of population in the Far-Western hill districts is described below:

MSM size :	1-3% of adult male population (aged 15-49)
MSM HIV prevalence :	0.5% - 1% assumed
FSW size :	assumed 100- 200 per district. No distinctions regarding street-based and establishment-based FSWs are made.
FSW HIV prevalence :	Low = 3% High = 5%, assumed as <i>Badis</i> and <i>Devakis</i> may be included in FSWs
IDU size :	600- 1000, assumed based on some border points like Jhulaghat, Dharchula in these districts
IDU HIV prevalence :	Low = 22% and High = 35%, assumed slightly lower than highway districts
Clients Size :	(no. of FSW x 4.2 clients per week x 52 w)/10 [10 is a factor to adjust repeated visits: average number of visits of a client per year],
Clients HIV prevalence :	estimated as 2-3 times less than the prevalence for FSW
Migrants size :	60% - 80% of adult male population on the basis of the FHI/CARE's community assessment
Migrants HIV prevalence :	Low = 3.7%, average prevalence for migrants visiting India, based on FHI's Achham survey, High = 7.7%, prevalence for Mumbai returnees in Achham [Doti survey showing 10% is not used in view of its controversy about sample size and design]
Size of partners :	Size estimates for partners of high-risk populations are based on the proportions married
HIV prevalence for partners :	HIV prevalence for partners assumed half of their high-risk counterparts

3.3.4 ESTIMATES OF HIV CASES FOR REMAINING DISTRICTS

By geographical area and population size this is the largest of the four epidemic regions delineated for the HIV estimation purpose. But the contribution of this region to the national total of HIV cases is relatively low because of low number of high-risk populations such as IDUs and FSWs and low prevalence of HIV among almost all subpopulations.

Estimates of HIV infections in this region are about 10,000 on average, ranging between 5,000 and 16,000. If the given assumptions about HIV prevalence remain correct, seasonal labor migrants and the rural women comprise nearly nine out of ten HIV infections in these districts (Table 9). As male labor migration is a need of the rural hills of Nepal and use of condom while having sex with wife is minimum in all sub-groups, such estimates seem plausible.

Table 9. Regional estimates of adult HIV cases: Remaining districts

Remaining districts	Size estimates		HIV prevalence		Average PLWHA	
	Low	High	Low (%)	High (%)	N	% of total PLWHA
IDU	500	1,000	22.00	35.00	214	2
MSM	17,000	51,000	0.50	1.00	255	3
Sex workers	2,000	4,000	1.00	3.00	60	1
Clients of sex workers	21,000	43,000	0.33	1.50	293	3
Seasonal labor migrant	150,000	250,000	1.85	3.85	5,700	58
Urban female low risk population	68,482	68,562	0.10	0.30	137	1
Rural female low risk population	1,606,137	1,627,257	0.10	0.30	3,234	33
Total					9,893	100.0

Estimates and assumptions for size and HIV prevalence: Remaining districts

Some assumptions made on the calculation of size and the prevalence of HIV for some sub-groups of population in the remaining hill districts is described below:

MSM size :	1-3% of adult male population aged 15-49
MSM HIV :	0.5%-1% assumed
IDU size :	500- 1,000 assumed (assuming presence of IDUs in market places along the border areas and headquarters)
IDU HIV prevalence :	Low = 22% and High = 35%, assumed slightly lower than highway districts
Clients Size :	no. of FSW x 4.2 clients per week x 52 w)/10 [10 is assumed as a factor to adjust repeated visits: average visits of clients],
Clients HIV prevalence :	Low = 1% and High = 2% assumed [assuming low level of interaction with high-risk clients)
Migrant size :	10% - 15% of adult male population (assumed on the basis of absentees population in 2001 Population Census)
Migrant HIV prevalence :	Low = 0.6%, migrants Kailali High = 2.7%, average of STI

3.3.5 NATIONAL ESTIMATES OF HIV CASES

National estimates are derived as the sum of the regional estimates. Regional level size estimates of each of the subpopulations considered in the current model are added up to obtain a total number for the entire country. HIV prevalence estimates are derived as the weighted average of the regional level prevalence estimates.

In total, 60,000 adult HIV cases are estimated in the country as of the end of 2003. The estimated number of HIV infections range from 28,000 to 102,000. The 26 districts along the major highways have almost half of the estimated HIV cases followed by nearly one fourth in the Far-West hill districts. About one in eight HIV estimated PLWHA cases are in the Kathmandu valley and about one in six cases in the remaining hill districts.

Table 10. National estimates of adult HIV cases

	Estimated number of PLWHA				Average
	Low-Low	Low-High	High-Low	High-High	
Kathmandu valley	5,915	8,042	7,550	10,250	7,939
Highway districts	10,730	32,466	18,389	52,368	28,488
Far-West hills	6,888	14,327	11,240	23,399	13,963
Remaining districts	4,735	11,519	6,979	16,337	9,893
Total	28,268	66,353	44,158	102,354	60,283

The estimated number of adult HIV cases, when examined by the three sub groups at varying levels of HIV risk, shows a different scenario (Table 11). Three-fourths of the total HIV cases belong to high-risk sub-groups such as IDUs, MSM, sex workers and their clients, and seasonal labor migrants. The remaining one in four HIV cases belong to the low-risk populations such as women in general in urban and rural areas including partners of the high-risk subpopulations.

Table 11. National estimates of adult HIV cases by sub-populations

	Kathmandu valley	Highway districts	Far-West hills	Remaining districts	Total	% of Total cases
Population at higher risk						
IDU	3,060	4,960	228	214	8,462	14
MSM	75	499	42	255	871	1
Sex workers	423	510	42	60	1,035	2
Clients of sex workers	2,647	7,458	393	293	10,791	18
Seasonal labor migrant	713	8,456	9,690	5,700	24,559	41
SUBTOTAL						76
Population at lower-risk						
Urban female low risk pop	613	991		137	1,741	3
Rural female low risk pop	408	5,614		3,234	9,256	15
SUBTOTAL						18
For Far-West Hills						
Partners of IDU			46		46	0
Female partners of MSM			13		13	0
Partners of Clients of sex workers			118		118	0
Partners of migrants			3,391		3,391	6
SUBTOTAL						6
TOTAL	7,939	28,488	13,963	9,893	60,283	100

Note: Partner option was only used for the Far -West regions where no HIV related data of ANC clients was available. In fact, ANC visit in this region is very low (less than a third according to the 2001 NDHS).

Percentages in the last column are rounded so less than 0.5% has been seen as "0" .

Some major indicators of the HIV epidemic generated from the estimation model are presented in Table 12. The estimate shows that HIV prevalence in the general adult population is less than one percent (0.52%). Of the total estimated HIV cases, one in four cases is a woman. Only among IDUs is the average national HIV prevalence more than five percent. The average prevalence of HIV among MSMs, FSWs and their clients are below five percent.

Table 12. Summary of indicators derived from the national estimates for the year 2003

Indicators	Estimated number/percentage
Number of Adults (15-49) PLWHA	60,283
Adult Prevalence (15-49)	0.52%
Number of Women (15-49) PLWHA	15,599
% of adults (15-49) who are women	25.88%
% of total population (15-49) who are IDUs	0.2%
% of men (15-49) who are MSM	2.0%
% of women (15-49) who are sex workers	0.4%
% of men (15-49) clients of female sex workers	8.9%
PLR to PHR ratio	0.32
HIV prevalence rate (%) in IDUs	38.4%
HIV prevalence rate (%) in MSM	0.8%
HIV prevalence rate (%) in sex workers	4.2%
HIV prevalence rate (%) in clients of sex workers	2.1%

4. DISCUSSION

Over 60 thousand people, with one-fourth women, were living with HIV/AIDS at the end of 2003. In view of the upward trend in the number and HIV prevalence for key at-risk populations, this number will keep on increasing unless aggressive interventions are put in place. Key risk groups such as IDUs, FSWs and their clients, and labor migrants are at the epicenter of the epidemic, and the interventions targeted to these groups will determine the extent to which these high-risk groups will be infected and also spread HIV into the general population.

The present estimation of adult HIV cases has a number of limitations, which need to be considered during interpretation. Although new information on HIV was available for a number of risk groups in various locations, inadequacy of such information was felt for some emerging risk-groups or locations. Where epidemiological or behavioral information are not available or less reliable, informed estimates were made on the basis of information available for similar subpopulations or locations. Certain risk groups such as migrant populations may need to be categorized further in terms of sex, places of origin (West vs. East) and places of destination (Mumbai vs. other places). Intra-country mobile populations (or floating populations such as truckers, laborers, businessmen), cross-border migrants (seasonal and temporary migrants), and MSM need to be studied in greater detail. Additional information on size and risk behaviors of these groups would be desirable.

Assumptions in this model have been made on the number and HIV prevalence for MSM. Given these assumptions, MSM account for a negligible proportion (about one percent) of the total HIV infections in the country. Dropping the MSM subpopulation from the model could reduce the entire estimate by about one thousand cases. On the other hand, if this group is engaged in risky behaviors and HIV prevalence is over five percent, they can emerge as a significant driving force of the HIV epidemic in Nepal.

Limitations of the sentinel surveillance data need special discussion. Available information indicates that published sentinel surveillance data do not provide the proportion of STI patients in the sample by the type of patients. For example, several data sets are not segregated by sex of the patients tested; age, marital status and migration characteristics. It is very important to have these data presented separately for males and females. Moreover, in our context in particular, identification of migration status and possible source of the infections could be helpful not only for the estimation of HIV infections but also for identifying target groups. Overall, the entire HSS should be reviewed and strengthened to enable adequate monitoring of the emerging HIV epidemic redefining the subpopulations and locations included in the HSS.

A special feature of the Nepali HIV epidemic is that it is not confined to the urban centers; rather it is likely to be dominated by the rural epidemic to the extent the seasonal labor migrants continue to engage in risk behaviors.

The estimates indicate a variation in HIV epidemic in terms of geographic locations and subpopulations. IDUs, labor migrants, and FSWS and their clients constitute the major risk groups. Interventions focused in these groups will determine the course of the epidemic in the future.

One of the major constraints in the estimation of HIV cases in Nepal is the data gap. Although a relatively large number of studies have been conducted in the country, the coverage of the studies is limited. In some situations, the methodology used in the study is also not well defined. For instance, HSS has been not uniformly conducted over the years. In the beginning several high-risk groups were included in HSS but later it was focused only among STI patients. Moreover, a standard study protocol is lacking which causes difficulties to interpret the results obtained. For example, recruitment procedures of STI patients in all sentinel sites need to be clearly defined and data should be segregated by sex.

In Nepal, HIV epidemic among the labor migrants, particularly to high-risk cities like Mumbai in India, is increasing. But until now surveillance system does not cover this high-risk group. Similarly, because of the high prevalence of HIV among labor migrants, infection may have spread into the population of general women in some districts in Far West Nepal. Surveillance among ANC attendees is another issue that needs to be discussed.

As NCASC has formed a Surveillance Working Group and these issues are being discussed within the group, it can be expected that key issues will be addressed soon and major data gaps in HIV will be reduced.

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APPENDICES

Appendix A1: Estimation of FSWs population in highway districts
Percentage Distribution of Female Sex Workers by Districts

S.N.	Districts	# FSWs		Total Female Pop.	% FSWs in total women		Adult women 15-49	% FSWs in adult F	
		Min	Max.		Min.	Max.		Min.	Max.
1	Jhapa	578	736	346434	0.17	0.21	169753	0.34	0.43
2	Morang	461	605	420325	0.11	0.14	205959	0.22	0.29
3	Sunsari	623	796	310103	0.20	0.26	151950	0.41	0.52
4	Saptari	177	271	278873	0.06	0.10	136648	0.13	0.20
5	Siraha	205	288	278466	0.07	0.10	136448	0.15	0.21
6	Udayapur	82	112	143933	0.06	0.08	70527	0.12	0.16
7	Dhanusha	146	202	321944	0.05	0.06	157753	0.09	0.13
8	Mahottari	88	109	265576	0.03	0.04	130132	0.07	0.08
9	Sarlahi	214	242	306519	0.07	0.08	150194	0.14	0.16
10	Rautahat	177	222	262886	0.07	0.08	128814	0.14	0.17
11	Bara	305	391	269738	0.11	0.14	132172	0.23	0.30
12	Parsa	474	607	236808	0.20	0.26	116036	0.41	0.52
13	Makwanpur	256	348	193460	0.13	0.18	94795	0.27	0.37
14	Chitwan	473	632	236964	0.20	0.27	116112	0.41	0.54
15	Dhading	192	251	172794	0.11	0.15	84669	0.23	0.30
16	Nawalparasi	355	480	284613	0.12	0.17	139460	0.25	0.34
17	Rupandehi	550	691	347646	0.16	0.20	170347	0.32	0.41
18	Kapilbastu	183	254	234101	0.08	0.11	114709	0.16	0.22
19	Dang	217	258	233422	0.09	0.11	114377	0.19	0.23
20	Banke	543	703	187609	0.29	0.37	91928	0.59	0.76
21	Bardiya	221	305	189994	0.12	0.16	93097	0.24	0.33
22	Kailali	363	479	304386	0.12	0.16	149149	0.24	0.32
23	Kanchanpur	156	225	185989	0.08	0.12	91135	0.17	0.25
Total		7039	9207	6012583	0.12	0.15	2,946,166	0.24	0.31
							<u>Quartiles</u>		
							Qrt 1	0.15	0.20
							Qrt 3	0.26	0.36
							<u>Estimates</u>		<u>based on quartiles</u>
								9,716	13,589
								17,414	23,610
							<u>Estimates based on average</u>		
								15,861	20,746
							Total adult women 6,638,676		

Appendix A2:
Estimation of IDUs in the highway districts

District	Towns	Estimated Male IDUs	Total Male Population	% Male IDUs in total male population	Adult male pop 15-49 (estimated)	%male IDU in adult male 15-49
Jhapa						
	Mechi Nagar Mun. (Kakrbhitta and Dhulabari)	89	24823	0.4	11667	0.76
	Birtamod (Anarmani VDC)	71	14219	0.5	6683	1.06
	Chandragadi	15	7971	0.2	3746	0.40
	Bhadrapur Mun.	50	9133	0.5	4293	1.16
	Kerkha (Topgachi VDC)	75	9836	0.8	4623	1.62
	Sitapuri (Lakhanpur VDC)	20	6715	0.3	3156	0.63
	Damak Mun.	197	17546	1.1	8247	2.39
	Sub Total	517	90243	0.6	42414	1.22
Morang					0	
	Urlabari	20	12995	0.2	6108	0.33
	Pathari	21	10351	0.2	4865	0.43
	Belabari	17	9386	0.2	4411	0.39
	Birat Chowk (Indrapur VDC)	22	8373	0.3	3935	0.56
	Salakpur (Mirgauliya VDC)	17	6351	0.3	2985	0.57
	Biratnagar (Sub Metro Politan)	631	87664	0.7	41202	1.53
	Sub Total	728	135120	0.5	63506	1.15
Sunsari					0	
	Dharan Mun.	857	47121	1.8	22147	3.87
	Tarahara (Hansposa)	17	8468	0.2	3980	0.43
	Itahari Mun.	42	20597	0.2	9681	0.43
	Inaruwa Mun.	22	11844	0.2	5567	0.40
Sub Total	938	88030	1.1	41374	2.27	
Grand Total	2183	313393	0.7	147295	1.48	
<i>Note: Total male population obtained from the 2001 Census</i>						
Entire district						
Japa district	517	341675	0.15	160587	0.32	
Morang district	728	422895	0.17	198761	0.37	
Sunsari	938	315530	0.30	148299	0.63	
	2183	1080100	0.20	507647	0.43	

Highway districts	Estimated no. of IDUs	
Total pop	6,638,676	3319338
	Min 10,686	
	Max 20,995	

Appendix A3: National Estimates of Adult HIV Infections Nepal 2003

	Size estimates			HIV prevalence			Number of PLWHA			% of PLWHA in total PLWHA
	Low	High	Low	High	Low-Low	Low-High	High-Low	High-High	Average	
KTM Valley										
IDU	4,000	5,000	63.00%	73.00%	2,520	2,920	3,150	3,650	3,060	39%
MSM	5,000	15,000	0.50%	1.00%	25	50	75	150	75	1%
Sex workers-street-based	2,000	2,500	15.60%	17.00%	312	340	390	425	367	5%
Clients of sex workers	75,000	94,000	2.93%	3.33%	2,200	2,500	2,757	3,133	2,647	33%
Seasonal labor migrant	25,000	50,000	1.23%	2.57%	308	642	617	1,283	713	9%
Sex workers- estb-based	2,000	2,500	2.00%	3.00%	40	60	50	75	56	1%
Urban female low risk pop	305,980	306,580	0.10%	0.30%	306	918	307	920	613	8%
Rural female low risk pop	203,986	204,386	0.10%	0.30%	204	612	204	613	408	5%
Total					5,915	8,042	7,550	10,250	7,939	100%
HIGHWAY										
IDU	11,000	21,000	22.00%	40.00%	2,420	4,400	4,620	8,400	4,960	17%
MSM	33,000	100,000	0.50%	1.00%	165	330	500	1,000	499	2%
Sex workers	10,000	24,000	2.00%	4.00%	200	400	480	960	510	2%
Clients of sex workers	225,000	540,000	1.20%	2.70%	2,700	6,075	6,480	14,580	7,458	26%
Seasonal labor migrant	325,000	500,000	0.60%	3.50%	1,950	11,375	3,000	17,500	8,456	30%
Urban female low risk pop	494,301	496,401	0.10%	0.30%	494	1,483	496	1,489	991	3%
Rural female low risk pop	2,801,037	2,812,937	0.10%	0.30%	2,801	8,403	2,813	8,439	5,614	20%
Total					10,730	32,466	18,389	52,368	28,488	100%
FARWEST HILL										
IDU	600	1,000	22.00%	35.00%	132	210	220	350	228	2%
MSM	2,800	8,300	0.50%	1.00%	14	28	42	83	42	0%
Sex workers	700	1,400	3.00%	5.00%	21	35	42	70	42	0%
Clients of sex workers	15,000	30,000	1.00%	2.50%	150	375	300	750	393	3%
Seasonal labor migrant	130,000	210,000	3.70%	7.70%	4,810	10,010	7,770	16,170	9,690	69%
Partners of IDU	240	400	11.00%	17.50%	26	42	44	70	46	0%
Female partners of MSM	420	840	1.50%	2.50%	6	11	13	21	13	0%
Partners of Clients of Sex workers	9,000	18,000	0.50%	1.25%	45	113	90	225	118	1%
Partners of migrants	91000	147,000	1.85%	3.85%	1,684	3,504	2,720	5,660	3,391	24%
Total					6,888	14,327	11,240	23,399	13,963	100%

REMAINING																					
IDU	500	1,000	22.00%	35.00%	110	175	220	350	214												2%
MSM	17,000	51,000	0.50%	1.00%	85	170	255	510	255												3%
Sex workers	2,000	4,000	1.00%	3.00%	20	60	40	120	60												1%
Clients of sex workers	21,000	43,000	0.33%	1.50%	70	315	143	645	293												3%
Seasonal labor migrant	150,000	250,000	1.85%	3.85%	2,775	5,775	4,625	9,625	5,700												58%
Urban female low risk pop	68,482	68,562	0.10%	0.30%	68	205	69	206	137												1%
Rural female low risk pop	1,606,137	1,627,257	0.10%	0.30%	1,606	4,818	1,627	4,882	3,234												33%
Total					4,735	11,519	6,979	16,337	9,893												100%
National total					28,268	66,353	44,158	102,354	60,283												



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